BATTERY CHARGER RS-900

Instruction Manual

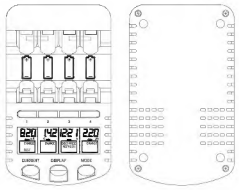
BEFORE USING OUR BATTERY CHARGER RS-900, READ IN DETAILS ALL INSTRUCTIONS CONTAINED IN THIS MANUAL. KEEP THIS MANUAL IN A SAFE PLACE AS YOU MAY NEED TO USE IT AT A LATER DATE.

We draw the attention of all users of this device: please follow the safety and maintenance instructions which are part of this manual. Also read the caution markings on the charger, the manual, and the gift box.

INTRODUCTION:

Congratulations on purchasing this intelligent charging unit which enables definitely quick and optimum charging to “AA” and “AAA” rechargeable batteries. With charging, discharging, refreshing and capacity test functions as well as individual LCD displays for charging compartments; this charging unit is reliable, user-friendly and ideal for use in the home, office or on journey.

The Charging unit



CAUTIONS:

1. The charger is restricted to **charging NiCd and NiMH rechargeable batteries only.** Never adopt this charger to other types of batteries such as alkaline, lithium, carbon zinc or other types that are not specified.
2. The charging unit shall only be used only at normal indoor room conditions.
3. Always follow the charging instructions for the rechargeable battery. Observe the recommended charging current of the rechargeable batteries. Never adopt a charging current higher than recommended in the charging process.
4. Never use any power cable and transformer other than those originally supplied with the charging unit.
5. The rechargeable batteries may become hot during charging (especially when high charging current is chosen). User shall take extra care when taking out the batteries after charging.
6. Unplug the charging unit from the power source when not in use.

FEATURES:

The Charging unit

- Charging rechargeable battery in various current (200, 500, 700 or 1000 mA). The

charging current can be set up to 1500 or 1800 mAh when two batteries are charged.

- Fast charging – 70 mins to charge up 2000 mAh batteries
- Individual LCD display for compartments
- Charging both “AA” and “AAA” rechargeable batteries simultaneously
- Overheat detection to protect rechargeable batteries from over-charging
- Minus delta voltage (-dV) detection for charge termination
- Damaged batteries detection
- Discharge mode (first discharging and then charging) to remove memory effect of rechargeable batteries
- Refreshing old rechargeable batteries by discharging/ charging cycles
- Test function to check the capacities of rechargeable batteries
- Charging/ Discharging functions can be launched independently and simultaneously to each rechargeable battery in the compartments
- Various display modes during charging/ discharging – the charging current (in mA), time elapsed (in hh:mm), the terminal voltage (in V) and accumulated capacities (in mAh or Ah)

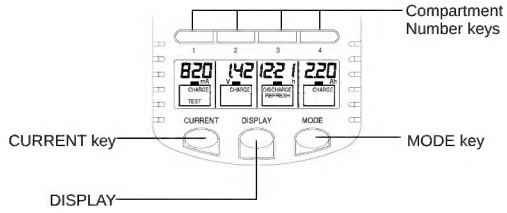
INVENTORY OF CONTENTS

1. Charging unit
2. Transformer

3. Size “C” battery adapter (4 nos.) & Size “D” battery adapter (4 nos.)
4. Holding Bag
5. "AA” rechargeable battery (4 nos.) & “AAA” rechargeable battery (4 nos.)
6. Instruction Manual

FUNCTION KEYS:

There are three easy-to-use function keys and four number keys in the charging unit:



Compartment Number key
Press and release the Number key to select a particular battery compartment for charge modes and/or display mode adjustment.

MODE key
The mode key shall first be pressed and held for 1 second to activate the mode change. The subsequent pressing of the mode key will enable to toggle between the “Charge”, “Discharge”, “Test” and “Refresh” mode. To change the operating mode for individual rechargeable battery, first press corresponding NUMBER key then press the MODE key.

DISPLAY key
Press and release to select the displays of the charging current (in mA), time elapsed (in hh:mm), the terminal voltage (in V) and accumulated capacities (in mAh or Ah) during the charging or discharging process.
To change the display content of a particular rechargeable battery, first press corresponding NUMBER key then press the DISPLAY key.

CURRENT key

Press to select the amount of current to be applied (within the first 8 seconds after batteries are inserted) in different operating modes (also see "**Start charging the rechargeable batteries**" below).

OPERATING MODES OF THE CHARGING UNIT

This powerful charging unit provides the following operating modes:

a. Charge up the rechargeable battery **(CHARGE)** – to charge up the rechargeable battery, automatically switch to trickle charge after rechargeable battery is full.

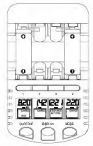
b. Discharge then charge up the rechargeable battery **(DISCHARGE)** – to discharge the rechargeable battery then charge it for minimizing the memory effect.

c. Refresh the rechargeable battery **(REFRESH)** – to refresh the rechargeable battery to its maximum capacity by charging and discharging the rechargeable battery repeatedly until no further increase in the capacity is estimated. For old rechargeable batteries or those have not been used for a long times, refreshing may bring the rechargeable battery back to the optimum condition.

d. Check the rechargeable battery capacity in mAh/ Ah **(TEST)**

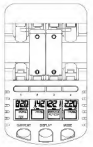
CHARGE MODE

Charging at 200 mA is the default-operating mode of the charging unit.
When only one or two numbers of rechargeable batteries are charged, provided that only compartment 1 and compartment 4 are used, a charging current up to 1500 or 1800 mA may be set by the pressing the CURRENT key.
On the other hand, when charging three or four numbers of rechargeable batteries at the same time, user may select a charging current of 200, 500, 700 or 1000 mA.

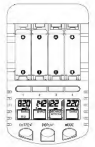


When charging two batteries at compartment 1 & 4 – max. charging current: 1800 mA

When charging two batteries at compartment 1 & 2 – max. charging current: 1000 mA



When charging two batteries at compartment 2 & 3 – max. charging current: 1000 mA



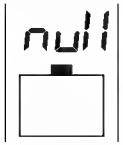
When charging four batteries – max. charging current: 1000 mA

The estimated time of charging by various charging current is tabulated in Table 1.

Table 1. Charging Time with various charging current			
Size of battery	Battery Capacity	Charging current selected (mA)	Estimated charging time
AA	2300 mAh	1800	~75 min
		1500	~90 min
		1000	~2 hr 15 min
		700	~3 hr 15 min
		500	~4 hr 30 min
		200	~11 hr 30 min
AA	2000 mAh	1800	~70 min
		1500	~80 min
		1000	~2 hr
		700	~3 hr
		500	~4 hr
		200	~10 hr
AAA	700 mAh	700	~60 min
		500	~84 min
		200	~3 hr 30 min

Note:

- User shall always observe the recommended maximum charging current of the rechargeable batteries. In general, 200 mA is a recommended charging current if rapid charging is not necessary. It is definitely safe and optimum to the rechargeable batteries.
- When the transformer has been plugged to the power source, the version number of the charger (for example “29”) will be displayed first. Then all the segments will light up momentarily and the “null” sign will be shown before batteries are placed. If damaged batteries are placed to the charging unit, the charger will also show “null” on LCD.



“null” displayed - No battery or damaged battery is placed to the charging unit

START CHARGING THE RECHARGEABLE BATTERIES

Once a rechargeable battery is inserted after the transformer has been plugged to the power source, the battery voltage (for example, "1.39V") will be displayed for 4 seconds. Then "200 mA Charge" (default mode) will be shown on LCD for another 4 seconds, indicating that charging with 200 mA is to be started if no alternation in setting is made.

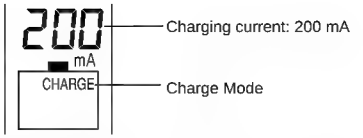
Within this 8-second time from inserting the batteries the user may first select the operating mode by the MODE key. (The mode key shall first be pressed and held for 1 second to activate the mode change. The subsequent pressing of the mode key will enable to toggle between the "Charge", "Discharge", "Test" and "Refresh" mode.)

Then within 4 seconds from the last key pressing, user may select the charging/ discharging current by pressing the CURRENT key.

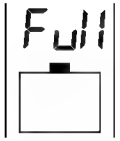
Note:

There is a 4-second time allowed for choosing further functions after each key pressing. If no more key is pressed, the LCD will blink one time to indicate the end of setting. Afterward, the current can no longer be changed during the process and the selected mode will be undergone.

After 4 seconds from no more keys pressing, the LCD will blink once to indicate the setting is confirmed and the selected mode activated



During charging, the different displays- Charging current (in mA), Time elapsed (in hh:mm), Terminal voltage (in V) and Accumulated capacities (in mAh or Ah) may be toggled and selected by pressing the DISPLAY key (refer Table 4).
After the rechargeable battery is fully charged, "Full" sign will be shown on the display and the user may take out them at this time. Or if the rechargeable batteries are kept placing at the compartments, trickle charging will start. The trickle charging current is around 5% of the selected charging current to keep the rechargeable batteries being full.



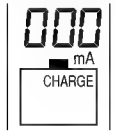
"Full" sign is shown -The battery is fully charged

Note :

- The current cannot be altered once the setting has been confirmed in the initial stage. This can avoid the user changing the current setting accidentally while doing setting on other rechargeable batteries. If one wants to change the applied current afterward, the rechargeable batteries must be taken out and inserted again.
- The maximum charging current of other rechargeable batteries are restricted by the current setting of the first inserted rechargeable battery. For instance, if the first inserted rechargeable battery is set to charge at 700 mA, then the second, third and fourth rechargeable batteries can be only set to charging at a maximum current of 700 mA.

Therefore, user is recommend to place the battery with the highest expected charging current at Compartment 1 first. To release the restriction of setting charging current, user shall take out all four rechargeable batteries from the charging unit.

- To change the operating mode during charging, one can press the MODE key (for selecting all rechargeable batteries) or NUMBER key then MODE key (for selecting individual rechargeable battery). 4 seconds after the last key press the LCD will blink one time to indicate the end of changing.
- When overheating condition occurs (over about 53°C, usually due to too high a charging current selected), the charging will be stopped immediately and the display will shown "000 mA", the charging process will only resume once the temperature of the rechargeable batteries drops to a safe level. If overheat conditions continue to occur, the rechargeable batteries shall be taken out to cool down and then charged at a lower current.

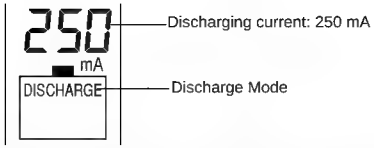


When the battery is overheated the charging will ceases automatically. "000 mA" will be displayed.

- For new rechargeable battery it is recommended to charge it with 200 mA current for re-conditioning it from the long storage status.

DISCHARGE MODE

Discharge mode will first discharge the rechargeable battery then charge it. It is for removing the memory effects of rechargeable batteries.
By pressing the MODE key within 8 seconds after inserting the rechargeable batteries, the Discharge mode can be selected. (The mode key shall first be pressed and held for 1 second to activate the mode change. The subsequent pressing of the mode key will enable to toggle between the "Charge", "Discharge", "Test" and "Refresh" mode.)
Then user may also select different discharging current (see Table 2) by pressing the CURRENT key, within 8 seconds after inserting the batteries. (The display will blink once to indicate the setting has been confirmed and the current cannot be changed afterward.)



Note: The discharging current is always set to be half of the coming charging current whose upper limit is 1000 mA (see Table 2). Therefore user is recommended to carefully select the discharging current so that the charging current afterward will not be too high.

Table 2. DISCHARGE MODE Current

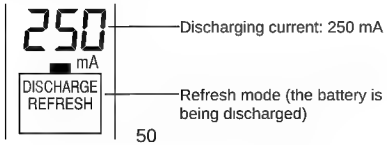
User-selected Discharging current	100 mA	250 mA	350 mA	500 mA
Thereafter Charging current	200 mA	500 mA	700 mA	1000 mA

Finally batteries will be fully charged in discharge mode and “Full” will be displayed. If user presses DISPLAY key at this time, "charge" icon instead of "discharge" icon will be displayed.

REFRESH MODE

Old rechargeable batteries and those have not been used for a long time require refreshing. This process will recover the optimum capacity of the rechargeable batteries. By pressing the MODE key within 8 seconds after inserting the rechargeable batteries, the Refresh mode can be selected.

Refresh mode will start with discharging the rechargeable battery, then charging it. The repeated discharging and charging cycles will be launched until no further increase in the measured capacities is estimated.



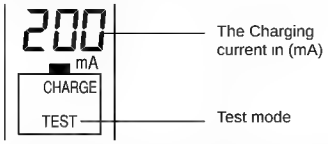
Note:

- By pressing the MODE key within 8 seconds after inserting the rechargeable batteries, the Refresh mode can be selected. (The mode key shall first be pressed and held for 1 second to activate the mode change. The subsequent pressing of the mode key will enable to toggle between the "Charge", "Discharge", "Test" and "Refresh" mode.) Then user may also select different discharging current by pressing the CURRENT key (see "Note" in Discharge mode and Table 2), within 8 seconds after inserting the batteries. (Or the display will blink once to indicate the end of setting and the current cannot be changed afterward.)
- It may take up to several days to finish the refreshing process, depending on the selected discharging current.
- The maximum refresh current is 1000 mA and not affected by the number of rechargeable batteries inserted.

TEST MODE

In Test mode the rechargeable batteries will first be fully charged and then discharged to determine the capacities. Finally, the rechargeable batteries are charged up again and the capacity in (mAh) of (Ah) will be estimated and shown after the discharging ends.

By pressing the MODE key within 8 seconds after inserting the rechargeable batteries, the Test mode can be selected. (The mode key shall first be pressed and held for 1 second to activate the mode change. The subsequent pressing of the mode key will enable to toggle between the “Charge”, “Discharge”, “Test” and “Refresh” mode.)

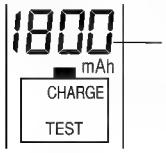


Note:

- After selecting the Test mode, user may select different charging current in the Test mode by pressing the CURRENT key, within 8 seconds after the batteries are inserted. The afterward-discharging current will be half of the selected charging current (see Table 3).

Table 3. TEST MODE Current				
User-selected Charging current	200 mA	500 mA	700 mA	1000 mA
Thereafter Discharging current	100 mA	250 mA	350 mA	500 mA

- The maximum charging current is 1000 mA and not affected by the number of rechargeable batteries inserted.
- After the test mode is finished, the display will shift between the "Full" sign and the battery capacity (in mAh or Ah) automatically in 3-second intervals until the rechargeable batteries are removed. User can switch to other displays by pressing the DISPLAY key.



Battery capacity displayed in (mAh) as the checking is finished in Test mode.

TRICKLE CHARGING

After the rechargeable battery is fully charged in any of the operating modes, the charger will give a small amount of current to the rechargeable batteries to maintain the fully charged level. This mode is automatically launched after rechargeable batteries are fully charged and kept at the charging unit. The signal “Full” will be displayed on the LCD.

DISPLAY MODE INFORMATION

User can use different display modes to monitor the rechargeable battery condition during the different operations (see below figure and Table 4 to 7).

Different display modes are exhibited: Charging current, Time, Voltage and Capacity

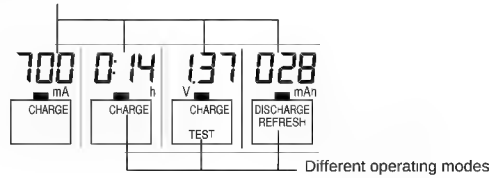


Table 4. Various displays in Charge Mode				
Stage in Charge mode	**Various displays (toggled by pressing DISPLAY key)**			
	Voltage (V)	**Current (mA)**	***Time (hh:mm)**	**Capacity (mAh/ Ah)**
During charging	Instantaneous Battery voltage	Charging current	Charging time elapsed	Accumulated capacity
Full stage		Trickle charging current		

Table 5. Various displays in Discharge Mode				
Stage in Discharge mode	**Various displays (toggled by pressing DISPLAY key)**			
	Voltage (V)	**Current (mA)**	***Time (hh:mm)**	**Capacity (mAh/ Ah)**
During discharging	Instantaneous Battery voltage	Discharging current	Discharging time elapsed	Capacity during discharging
During charging		Charging current	Charging time elapsed	Accumulated capacity
Full stage		Trickle charging current		

Table 6. Various displays in Refresh Mode				
Stage in Refresh mode	**Various displays (toggled by pressing DISPLAY key)**			
	Voltage (V)	**Current (mA)**	***Time (hh:mm)**	**Capacity (mAh/ Ah)**
During discharging processes	Instantaneous Battery voltage	Discharging current	Discharging time elapsed	Capacity during discharging
During charging processes	Instantaneous Battery voltage	Charging current	Charging time elapsed	Capacity determined in last time discharging
Full stage	Instantaneous Battery voltage	Trickle charging current	Elapsed time of last discharging	Maximum battery capacity determined in discharging

Table 7. Various displays in Test Mode				
Stage in Test mode	**Various displays (toggled by pressing DISPLAY key)**			
	Voltage (V)	**Current (mA)**	***Time (hh:mm)**	**Capacity (mAh/ Ah)**
During charging	Instantaneous Battery voltage	Charging current	Charging time elapsed	"--- mAh"
During discharging		Discharging current	Discharging time elapsed	"--- mAh"
During 2nd charging		Charging current	2nd charging time elapsed	Capacity of the battery determined in discharging
Full stage		Trickle charging current	Discharging time elapsed	Capacity of the battery determined in discharging

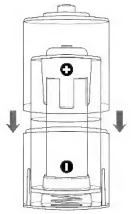
**The timer will be resumed and counted from 00:00 again after the time elapsed is longer than 20 hours. (For example, 1:45 will be shown after the battery has been refreshed for 21 hr and 45 min.)*

THE SIZE C AND SIZE D BATTERY ADAPTERS (FREE ACCESSORY)

The battery adapters are used for connecting the AA battery to the electric devices requiring Size C or D batteries. To apply the adapter:

1. Install the AA battery to Size C or Size D adapter as below.

The AA battery used with the Size C adapter



*The AA battery used with the Size D adapter (it is required to place the battery into the **"C" adapter first** and then the "D" adapter)*

2. Ensure the polarity is correct and the assembling condition is good.

Note:

- User shall stopping using the adaptor when there are any cracks or damages observed in the adaptor, and in case undesired smell comes out while applying the adapter in certain kinds of electric device.

CARE AND MAINTENANCE:

- Extreme temperatures, vibration and shock should be avoided as these may cause damage to the unit
- When cleaning the displays and casings, use a soft damp cloth only. Do not wet the exposed metal part of the charging unit. Do not use solvents or scouring agents as they may mark the LCD and casing.
- Do not spill water to the charging unit.
- Do not make any repair attempts to the units. Return it to its original point of purchase for repair by a qualified engineer. Opening and tampering with the units may invalidate its guarantee.
- Do not expose the unit to extreme and sudden temperature changes, this may lead to damage to the electronic parts in the unit.

SPECIFICATIONS:

Input voltage for AC/DC adapter	:	100-240 VAC
Charging current range	:	200 mA - 1800 mA
Max charging capacity (capacity of rechargeable batteries)	:	3000 mAh
Dimensions (L x H x W) of Charging unit	:	75 x 129 x 37.2 mm

LIABILITY DISCLAIMER:

- The manufacturer and supplier cannot accept any responsibility for any improper or incorrect use and any consequences occur.
- Any performance of repairs or alternations by someone other than the original supplier will invalidate the warranty.
- This product is only designed to be used by people who have read and understood this instruction manual.
- The specifications of this product may change without prior notice.
- This product is not a toy. Keep out of the reach of children.
- No part of this manual may be reproduced without written consent of the manufacturer.

CAUTION - SAFETY INSTRUCTIONS :

Attention of users is drawn to the following important safety instructions:

- **As stated in the manual above », only use NiCd or NiMH rechargeable batteries.**
- **Indoor use only, do not expose to humidity. Do not place in water or submit to rain and/or snow. Do not store or use near by an extreme heat. Keep batteries away from the fire.**
- **Do not use any accessories not supplied with the charger, unless recommended by La Crosse Technology. Especially, never use any power cable and transformer other than those originally supplied with the charging unit.**
- **Disconnect the AC/DC when not in use**
- **Do not operate the charger if it has received a blow or has been subject to any damage.**
- **Do not use the Battery charger for other purposes than the Only one originally forecast**
- **Do not open or/and disassemble the charger: such handling may result in a risk of electric shock or fire.**